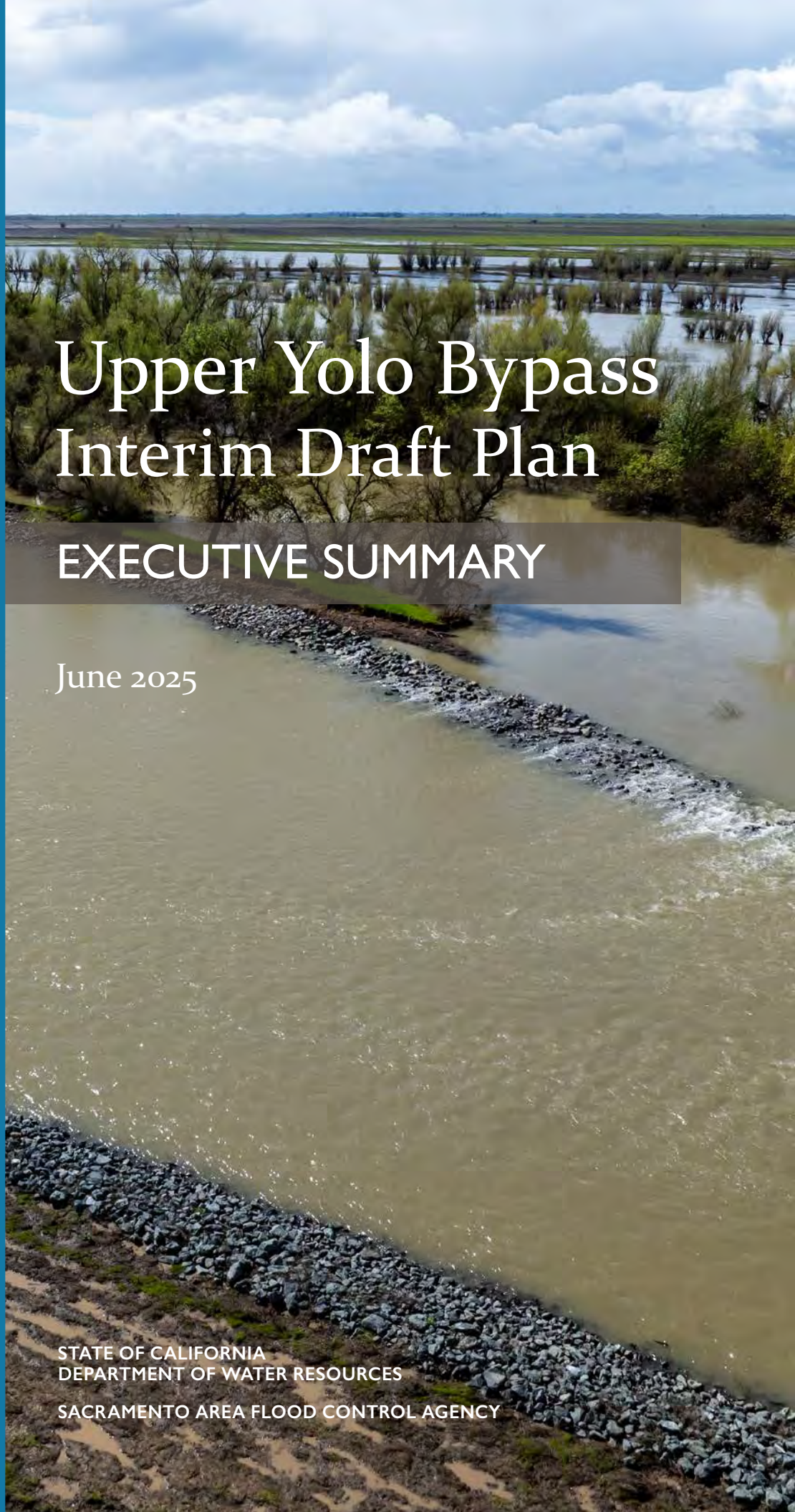


Upper Yolo Bypass Interim Draft Plan

EXECUTIVE SUMMARY

June 2025

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

SACRAMENTO AREA FLOOD CONTROL AGENCY

SAFCA
Sacramento Area Flood Control Agency

Lower Elkhorn Basin Levee Setback (LEBLS) Project, in Yolo County. Sara Nevis / California Department of Water Resources.

Upper Yolo Bypass Interim Draft Plan

EXECUTIVE SUMMARY

The Yolo Bypass is the center of the Sacramento River Flood Control Project, providing the vital space needed to spread out and slow the flood flows arriving from the Sacramento, Feather, and American Rivers. The Yolo Bypass also supports numerous other uses such as agriculture, habitat, and recreation.

Given its central location and features, the Yolo Bypass has been a focus of local, state, and federal efforts to improve flood conveyance, fisheries and wildlife habitats, water supply and water quality, agricultural land preservation, and economic development. The convergence of these efforts represents a major challenge as well as an opportunity for multi-benefit improvements (DWR, 2017). **Through thoughtful investment and meaningful engagement, the Bypass can continue to provide vital flood protection to the region while maintaining a key role in the local agricultural economy and ecosystem.**

The Upper Yolo Bypass Plan Interim Draft Plan (Plan) is a California Department of Water Resources (DWR) and Sacramento Area Flood Control Agency (SAFCA) product intended to guide future federal, State, and local investments in the Upper Yolo Bypass, the area between Fremont Weir and I-80. The Plan documents the Upper Yolo Bypass Regional Planning and Coordination Process (Planning Process) that DWR and SAFCA initiated in 2023.

This Planning Process advances a significant body of previous work regarding regional flood system improvements. Refer to the timeline on the subsequent page for more information. It also furthers concepts to enhance the Tule Canal's functionality. In parallel, the Planning process has tried to identify projects and programs with broader goals and interests

What is the Upper Yolo Bypass Plan?

- ✓ DWR-SAFCA planning document
- ✓ Concepts for improving flood and ecosystem resilience
- ✓ Preliminary costs and benefits
- ✓ Interested party feedback

What it is not:

- ⊗ Environmental compliance
- ⊗ Engineering design
- ⊗ Operations and maintenance plan
- ⊗ Parcel-level impact analysis

that could be integrated into their flood and ecosystem planning to provide additional local benefits. The Planning Process also synchronizes with other ongoing efforts such as the U.S. Army Corps of Engineers' (USACE) Yolo Bypass Comprehensive Study (Comprehensive Study).

USACE is advancing that parallel federal planning effort to determine whether there is federal interest in new flood management projects and ecosystem improvements in the Bypass, which could lead to federal funding. Through their joint role as non-federal sponsors, SAFCA and the State intend to share the Planning Process' technical analyses and findings with USACE.

The Planning Process was guided and informed by a Steering Committee consisting of Reclamation District 1600, Yolo County, DWR, SAFCA and the Central Valley Flood Protection Board (CVFPB). Note, Steering Committee participation is not an endorsement of the Plan and its contents. Rather, the Steering Committee helped the Planning Team (DWR, SAFCA, and their consultants) effectively reach interested parties and identify and explain constraints, challenges, and opportunities likely to resonate with those interested parties. The Planning Team proactively engaged with Yolo County, local government agencies, landowners, and other interested parties. **From June 2023 to April 2025, SAFCA and DWR held or participated in twenty-five meetings with interested parties, three workshops, and one public meeting with the Yolo County Board of Supervisors.**

Interested Party Feedback on Yolo Bypass Investment and Modifications

Opportunities

- ✓ Drainage improvements
- ✓ Levee repairs
- ✓ Groundwater recharge
- ✓ Wildlife-friendly agriculture projects
- ✓ Cache Creek Settling Basin improvements

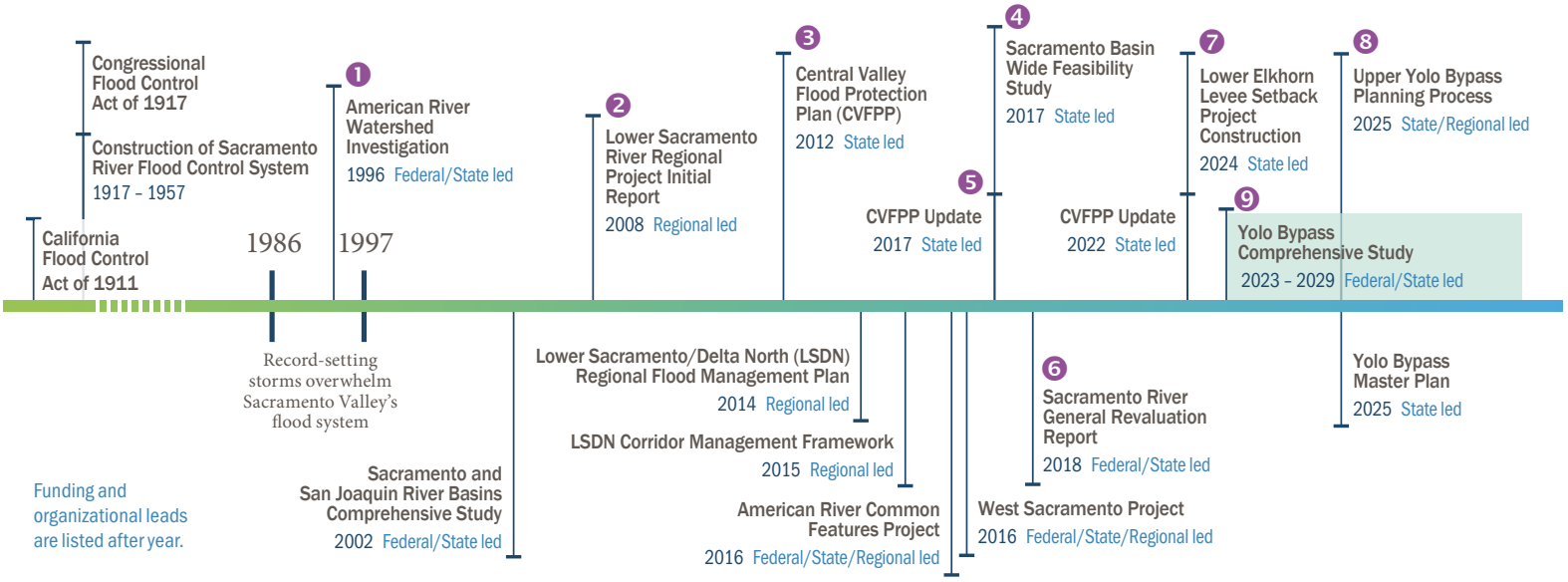
Concerns

- ⊗ Long-term operations and maintenance
- ⊗ Seepage
- ⊗ RD 1600 viability
- ⊗ Construction impacts
- ⊗ Agriculture viability
- ⊗ Reduced tax revenue
- ⊗ Illegal dumping and tresspassing

These engagements and a review of previous studies informed a suite of multi-benefit goals and objectives for the Planning Process; these goals identified locally desired outcomes for agriculture, water supply, water quality, and recreation as well as flood protection and ecosystem resilience. In addition to desired positive updates to the Bypass landscape, local interested parties identified potential impacts from significant Bypass infrastructure changes that should be avoided or minimized, such as negative effects on private property, agriculture operations, property tax revenue, and more.

Concepts for Systemwide Flood Management Improvement:

A SUMMARY OF MAJOR PLANNING EFFORTS AND RECOMMENDATIONS FOR YOLO BYPASS EXPANSION



From the mid-1800 onward, local agencies constructed levees along the Sacramento River to provide flood protection to their fields, but by the early 1900s, ongoing floods made it clear that the existing single channel levee system could not protect against the highest flood waters. In 1911, the State of California signed the California Flood Control Act of 1911, which endorsed a centrally managed, bypass-based Sacramento River Flood Control Plan Project (SRFCPP) designed to mimic the hydrology of the natural floodplains. The federal government also pledged financial support to SRFCPP construction in 1917, which was ultimately completed in 1957.

In February 1986, a series of major storms brought record-setting rain that overwhelmed the Sacramento Valley's flood system: dams released maximum flows, levees failed, and towns flooded. This tragic event led to the death of 13 people and an estimated $400 million in damages. The disaster emphasized the need for significant regional flood system improvements. In the face of climate extremes and continued population growth in the Central Valley, public officials realized both that existing regional flood system facilities needed maintenance and improvement, but also that new facilities would be needed, to provide protection from larger floods.

State, federal, and local agencies with responsibility for protecting the public from flood danger began a series of studies, each building on the next, to determine how to most effectively provide additional flood protection across the valley. The studies highlighted are those that significantly advanced the details around how to expand the Yolo Bypass to reduce flood risk in the Sacramento, Feather, Yuba, and American River watersheds, and have also resulted in the on-going construction of over $5 billion in flood risk reduction measures in the region.

In 1996, the joint state-federal ❶ **American River Watershed Investigation** identified several regional flood system projects, including an expanded Fremont Weir and larger Yolo Bypass. However, the Fremont Weir expansion was not analyzed further in favor of more immediate flood system improvements along the American River.

In 2008, a regionally-led ❷ **Lower Sacramento River Regional Project** focused on unacceptably high flood risk to Sacramento, West Sacramento, and the adjacent agricultural areas. It investigated whether a large-scale modification to the Yolo Bypass would be technically feasible and result in the reduced water levels along the Lower Sacramento River. The Study determined that a combination of actions, including **widening the Fremont Weir and Yolo Bypass with setbacks in Upper and Lower Elkhorn Basins along with widening of the Sacramento Weir and Bypass, would result in a significant increase in flood protection to the rural and urban areas in the Study area**.

In the 2012 ❸ **Central Valley Flood Protection Plan (CVFPP)**, the State shared their long-term approach to regional flood management: (1) landscape-level flood risk reduction that **protects large, small, and agricultural communities**; (2) ongoing and phased investment to reduce flood risk incrementally over time; and (3) prioritization of projects that provide multiple benefits beyond flood protection.

Based on the 2008 Lower Sacramento River Regional Project analysis, the Plan **recommended expanding the Yolo Bypass** through a combination of actions that included widening of the Fremont Weir in Upper Elkhorn, setting back the lower Elkhorn Yolo Bypass levee and expanding the Sacramento Weir and Bypass. This approach was **intended to provide system-wide benefits**, lowering flood levels for both rural and urban levee districts in Yolo, Sutter, and Sacramento Counties, as well as providing ecosystem benefits.

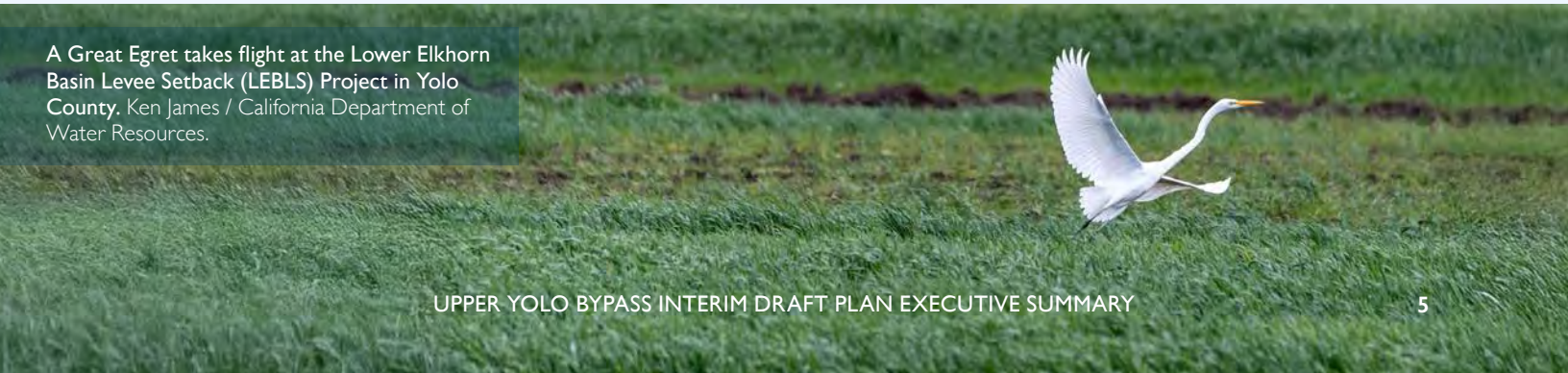
The 2017 ❹ **Sacramento Basin Wide Feasibility Study** advanced the 2012 CVFPP recommendations by analyzing a range of Fremont Weir expansion options. The Study stressed that **weir widenings and bypass expansions were the best options** – hydraulically and economically– to reduce flood risk in the system. These technical analyses informed the more detailed recommendations in the 2017 ❺ **CVFPP Update**.

In the 2018 ❻ **Sacramento River General Revaluation Report**, the federal government evaluated similar options as those identified in the CVFPP. The **State hoped this would result in federal funding for the implementation of the Fremont Weir widening and Bypass expansion**. However, ultimately, costs were too high and projected economic benefits did not meet the federal government's thresholds.

Between 2022 and 2025, **implementation of the CVFPP's systemwide priorities within Yolo Bypass were initiated**. The first steps were construction of a ❼ **Lower Elkhorn Levee Setback** and the Sacramento Bypass, widening of the Sacramento Weir and construction of the Lookout Slough Project in the lower Bypass.

The 2023 – 2025 ❽ **Upper Yolo Bypass Planning Process**, funded by the State and led regionally, studies two alternatives for expanding the bypass: a levee setback in Upper Elkhorn similar to the ones recommended in 2017 CVFPP as well as a secondary bypass, a concept suggested by a local interested party. The Interim Draft Plan **recommends a Setback Levee alignment that optimizes flood protection while minimizing land conversion**.

In 2023, the federal government initiated the ❾ **Yolo Bypass Comprehensive Study**, a broader analysis that looks at potential environmental and recreation benefits as well as flood. It will analyze several concepts for bypass expansion, including those from the Upper Yolo Bypass Plan, and is **another opportunity to determine if there is federal interest in and potential funding** for expanding the Yolo Bypass as well as other projects.



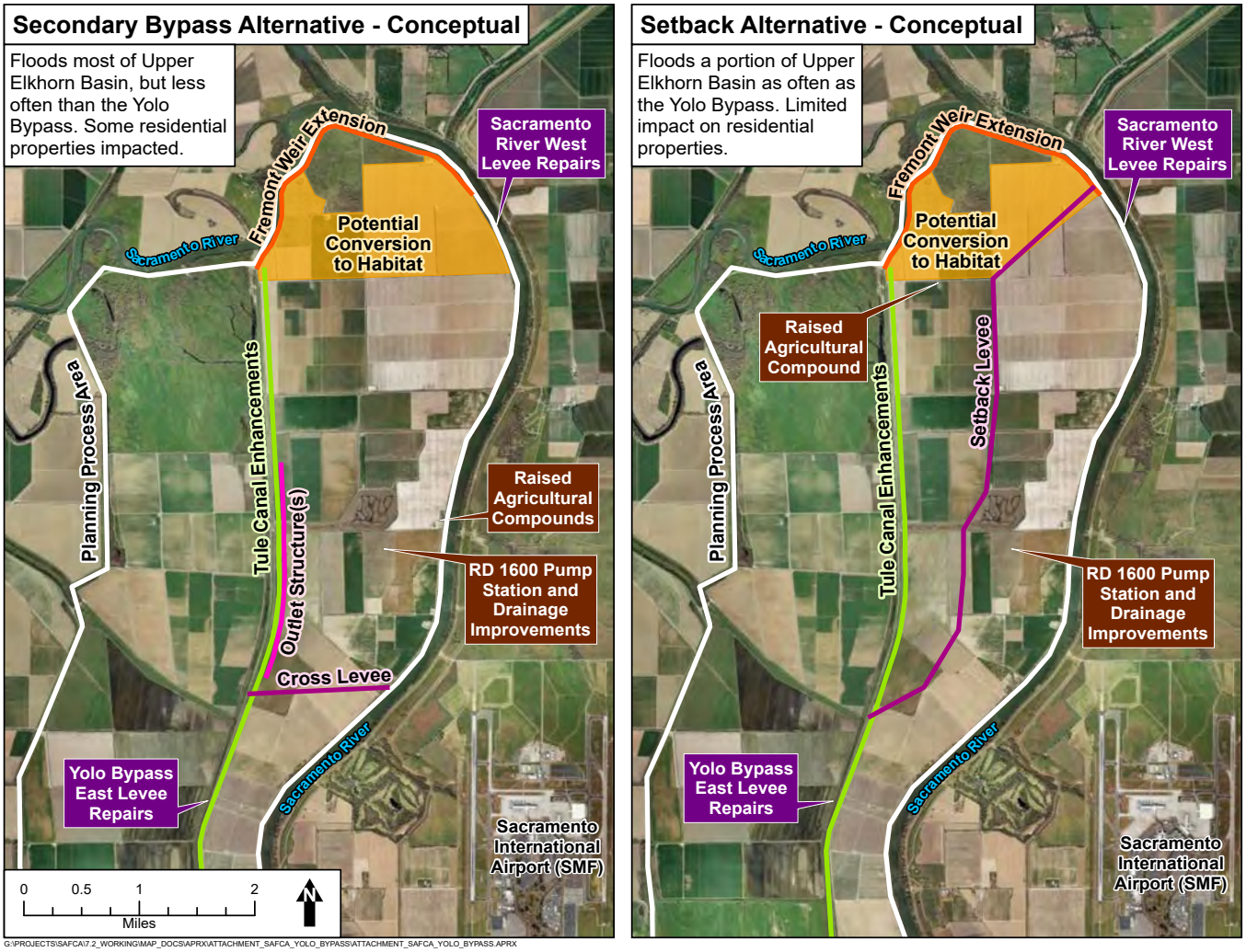
A Great Egret takes flight at the Lower Elkhorn Basin Levee Setback (LEBLS) Project in Yolo County. Ken James / California Department of Water Resources.

Concepts for Fremont Weir Expansion

The Planning Team developed two flood risk management concepts for the Fremont Weir expansion, an expansion plus a setback levee (Setback Levee alternative) and an expansion with an outlet and cross levee (Secondary Bypass alternative). The Setback Levee alternative advances numerous previous studies whereas the Secondary Bypass alternative is a new concept suggested during local outreach.

Figure 1 shows the concepts on the ground and highlights the similarities and differences between them. The Setback Levee alternative includes an expanded Fremont Weir at the same height as the existing weir, flooding a portion of the Upper Elkhorn Basin at the same frequency as the existing Bypass. The Secondary Bypass also expands the Fremont Weir, but at a higher elevation which spills less frequently; more of Upper Elkhorn Basin would flood than with a setback levee, but not as often as the existing Bypass. Further, both flood system improvement alternatives can achieve multiple objectives by incorporating features for habitat, agricultural drainage, and more. **Note that all specifications (lengths, heights, alignments, acres, etc.) are preliminary estimates based on a conceptual design, subject to change.**

Figure 1. Flood System Improvement Alternatives



Yolo Bypass Salmonid Habitat Restoration and Fish Passage (Big Notch) Project, built into the Fremont Weir. Andrew Nixon / California Department of Water Resources.

The Planning Team evaluated and compared the two flood risk management alternatives along several parameters—flood risk reduction, capital and operations and maintenance (O&M) costs, O&M complexity, potential agriculture impacts, and potential impacts to conservation easements (see Table 1 for a summary). The alternatives are roughly the same cost and produce similar reductions in flood stage, which translates to reduced risk of flood and economic damage. Both rural and urban communities would benefit from flood risk reduction to homes, businesses, critical infrastructure, property, and crops. Throughout the Sacramento River Basin, the alternatives could provide between $28.6M to $31.3M in total annual flood damage reduction benefits.

Table 1. Evaluation and Comparison of Flood System Improvement Alternatives

	Flood System Improvement Alternative	
Evaluation Category	**Setback Levee**	**Secondary Bypass**
BENEFITS:		
Flood Risk Reduction	Equal benefit	Equal benefit
Operations & Maintenance Ease	Greater benefit	
COSTS:		
Capital Costs		Higher cost
Economic Impact of Agriculture Land Conversion		Higher cost
Operations & Maintenance Cost	Higher cost	

Disclaimer: This qualitative comparison is based on preliminary analysis and estimates of conceptual designs. It is only intended to provide a relative comparison of the alternatives' performance and cost, and is subject to change as the alternatives are refined.

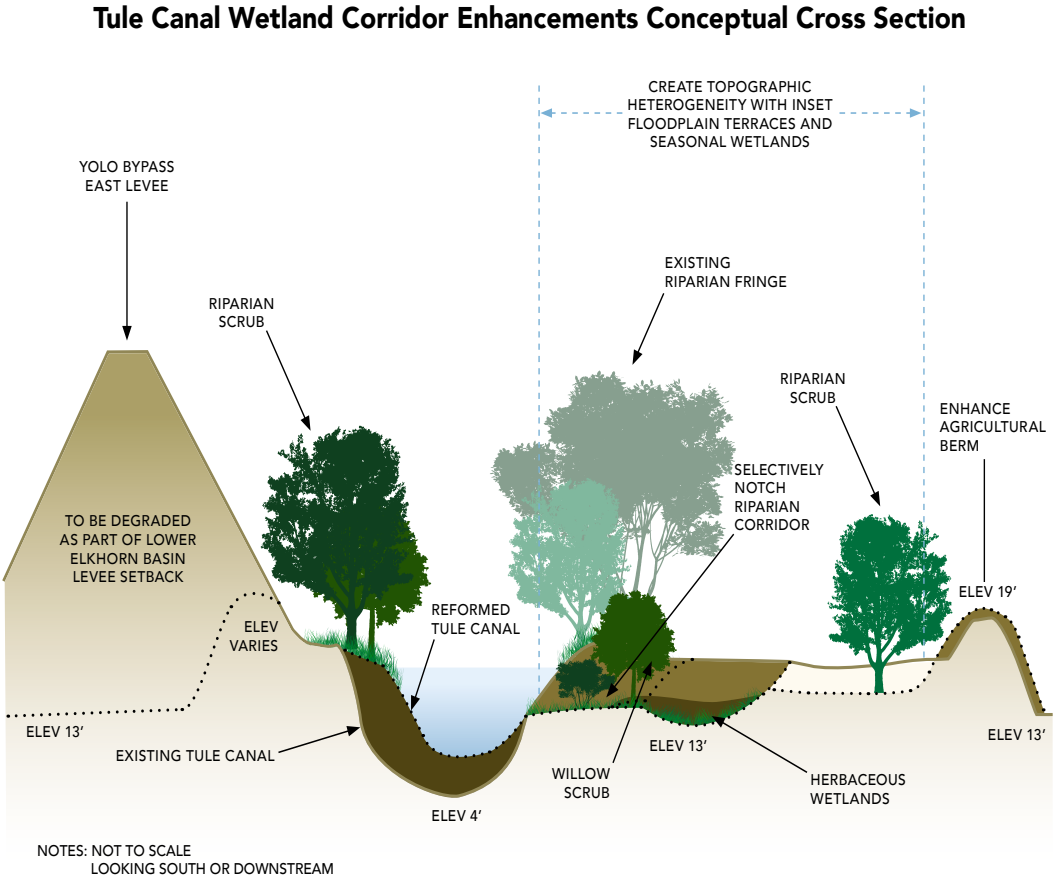
The key difference between the alternatives is how well they avoid undesirable impacts on residents, landowners, and the local economy. **The Setback Levee alternative has less impact to private property, agricultural production and revenue, conservation easements, and local tax revenue when compared to the Secondary Bypass alternative.** These preliminary conclusions were informed in part by an agriculture economic analysis, as requested by interested parties. This Plan does not offer precise details nor mitigation options for any impacts, as the alternatives are still at the conceptual level. Yet even at this conceptual level, the Planning Team identified a clear difference in the scale of local impacts between the alternatives and therefore, recommended that the Setback Levee alternative for consideration by the USACE as part of the Comprehensive Study.

Throughout the Sacramento River Basin, the flood alternatives provide between $28.6M and $31.3M in total annual flood damage reduction benefits.

Tule Canal Improvement Concepts

In addition to the flood risk management alternatives, the Planning Team developed three Tule Canal functional enhancement alternatives. These concepts build on previous efforts, such as the 2021 Tule Canal Charette, to identify Tule Canal problems and opportunities. The Tule Canal serves multiple purposes, including agricultural drainage, water supply, riparian habitat, and fish passage. However, ongoing issues related to lack of consistent operations and maintenance have diminished the Tule Canal's ability to serve these purposes. The Planning Team developed three conceptual alternatives to increase the Canal's functionality—the Water Supply and Drainage, Small, and Large alternatives. A map of these alternatives can be found in Chapter 4 and a cross-section concept depiction is found in **Figure 2**.

Figure 2. Enhanced Tule Canal Cross Section Rendering



Eighteen acres of native riparian vegetation planted for the Lower Elkhorn Basin Levee Setback (LEBLS) Project. Sara Nevis / California Department of Water Resources.

Cache Creek Settling Basin Weir in Yolo County near Woodland, California. Florence Low / California Department of Water Resources.

The Water Supply and Drainage alternative includes those measures necessary to alleviate current deficiencies (e.g., excessive sedimentation, invasive aquatic vegetation, canal debris blockages, and constrained fish passage). It includes some minor channel reshaping and habitat improvements but does not create a riparian corridor. In addition to all measures in the Water Supply and Drainage alternative, the Small and Large alternatives include a riparian corridor, which differs in size in each alternative according to the name. The Tule Canal alternatives were evaluated and compared based on compatibility with flood alternatives, capital costs, O&M ease, drainage and water supply improvements, habitat corridor benefits, economic impacts of lost revenue from agriculture land conversion, and inclusion of recreation. Table 2 identifies how each Tule Canal alternative comparatively ranks in the categories listed above.

All Tule Canal Enhancement Alternatives are compatible with the flood alternatives and equally enhance water supply and agricultural drainage. They also improve system management and maintenance, but do not currently have any recreation components given interested party concerns with trespassing, illegal dumping, and maintenance funding.

Table 2. Evaluation and Comparison of Tule Canal Enhancement Alternatives

	Tule Canal Enhancement Alternative		
Evaluation Category	**Water Supply & Drainage**	**Small**	**Large**
BENEFITS:			
Compatibility with Flood Alternatives	Equal benefit	Equal benefit	Equal benefit
Drainage Improvement	Greater benefit		
Operations and Maintenance Ease	Equal benefit	Equal benefit	Equal benefit
Water Supply Enhancement	Equal benefit	Equal benefit	Equal benefit
Habitat Corridor			Greater benefit
Recreational Opportunities Included	N/A	N/A	N/A
COSTS:			
Economic Impact of Agriculture Land Conversion			Highest cost
Capital Costs			Highest cost

Disclaimer: This qualitative comparison is based on preliminary analysis and estimates of conceptual designs. It is only intended to provide a relative comparison of the alternatives' performance and cost, and is subject to change as the alternatives are refined.

The primary differentiators between the alternatives are habitat corridor creation and economic impacts of lost revenue from agriculture land conversion. Of the Tule Canal alternatives, only the Tule Small and Large alternatives restore ecological function and expand the size of riparian and wetland corridor in an ecologically

significant way. The Tule Large increases the habitat corridor size more than the Tule Small, but the trade-off is more revenue loss from agriculture land conversion. Additional information is needed from landowners adjacent to Tule Canal to understand the extent of these landscape changes, as well as their preferred vision for the Tule Canal. It is anticipated that the conceptual level alternatives will become refined over time.

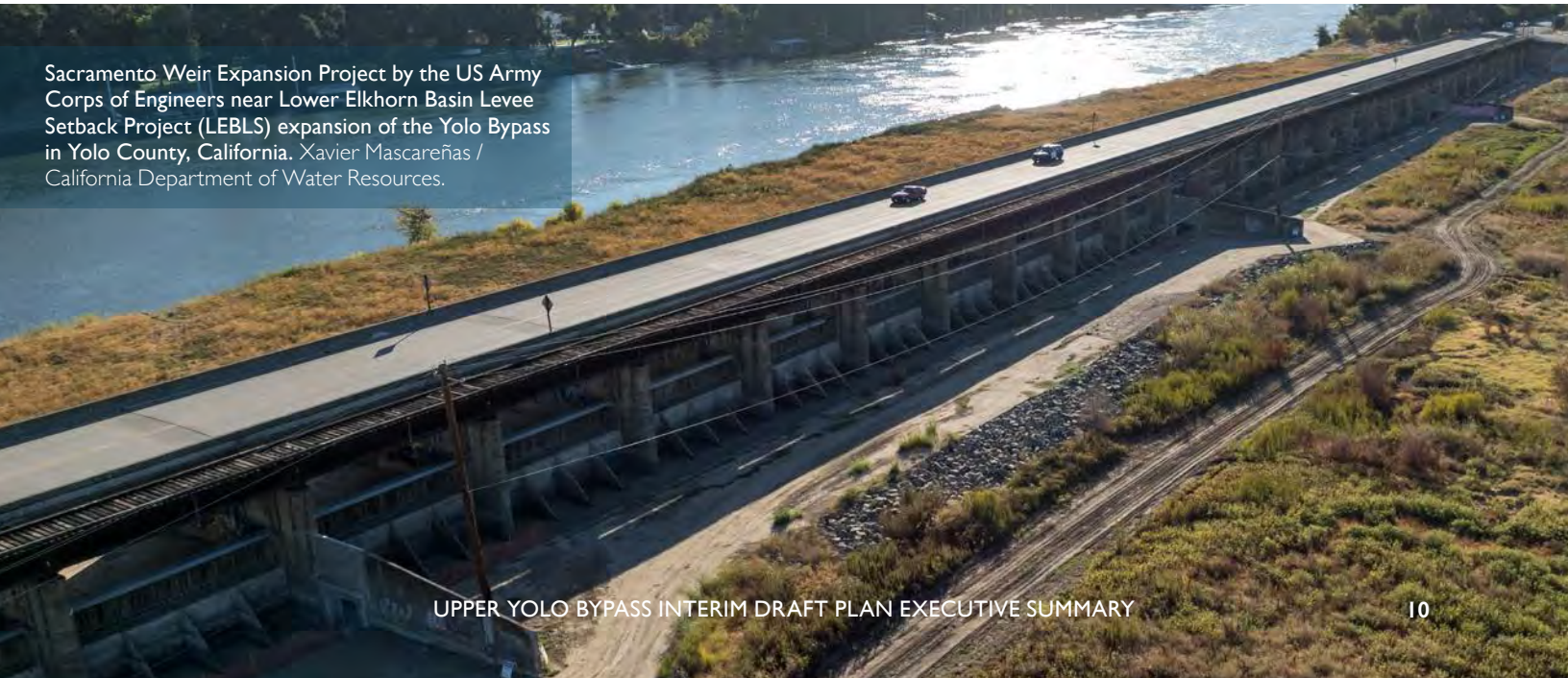
What's Next?

While the federal Comprehensive Study is ongoing, the Upper Yolo Bypass Planning Team will address some of the remaining information gaps in their work. For example, the Plan does not address or identify O&M roles, responsibilities, or funding opportunities. Through additional efforts, the Planning Team is working to determine Reclamation District 1600 viability as well as potential long-term O&M options for the future system. The Planning Team will continue their outreach and engagement efforts as well, keeping interested parties updated on important outcomes and decisions.

This Planning Process has helped DWR and SAFCA better understand local concerns to inform future modifications to the Bypass. While the exact amount of revenue loss from land conversion and additional flooding remains unknown, the Planning Team acknowledges that future infrastructure and land use changes will have some negative impacts as well benefits for local parties. Ongoing discussion with interested parties will be vital to shape the development of mechanisms that consider landscape-wide resilience for the agricultural economy. The Plan will remain an interim draft as more information is developed and the Comprehensive Study progresses.

Ongoing discussion will be vital to develop mechanisms that support landscape-wide resilience for the agricultural economy.

Cover image: Lower Elkhorn Basin Levee Setback (LEBLS) Project in Yolo County when inundated with water. Photo by Sara Nevis / California Department of Water Resources.



Sacramento Weir Expansion Project by the US Army Corps of Engineers near Lower Elkhorn Basin Levee Setback Project (LEBLS) expansion of the Yolo Bypass in Yolo County, California. Xavier Mascareñas / California Department of Water Resources.